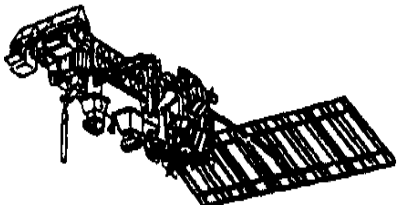
NOAA 10

National Oceanic And Atmospheric Administration 10 (G)

Spacecraft Sketch	Mission Objective
	The National Oceanic and Atmospheric Administration (NOAH A-G) specific objectives include obtaining improved quantitative environmental data and improved data handling capabilities through: 1) Higher resolution, day and night cloud cover observations on a local and global scale; 2) High resolution observations of sea surface temperatures; 3) Improved observations of vertical-temperature and water-vapor profiles in the troposphere and lower stratosphere; 4) Operational flight of an ozone sounder for monitoring the vertical distribution of atmospheric ozone; 5) Observations of vertical-temperature profiles in the middle and upper stratosphere on a global basis; 6) Operational flight of a high-capacity data collection/relay and platform location system; and 7) Observations of electron and proton flux densities and total particle energy densities in near-earth space environment.

TYPE OF MISSION	PROGRAM OFFICE	PROJECT LEAD CENTER	MANAGEMENT APPROACH	S/C CONTRACTOR	I&T CONTRACTOR
METEOROLOGICAL	SPACE & TERRESTRIAL APPLICATIONS	GSFC	OUT-OF-HOUSE	RCA	RCA

Payload Description

The National Oceanic and Atmospheric Administration (NOAH 10) payload consisted of seven instruments, a data collection system (DCS), a search and rescue (SAR) system and the spacecraft bus. The NOAA 10 spacecraft was one of the Advanced TIROS N (ATN) configuration spacecraft. The spacecraft consisted of two basic modules - the Equipment Support Module (ESM) and Reaction Support Structure (RSS) - which interfaced with the Instrument Mounting Platform (IMP). The ESM supported the earth-facing communications antenna and some of the earth-viewing sensors. The RSS supported the last-stage launch injection motor, the attitude control propulsion system and the boom-mounted solar cell array that continuously faced the sun during daylight portions of the orbit. On the IMP were mounted attitude control sensors and the instruments for which the scan directions had to be very accurately controlled.

INSTRUMENT NAME	ACRONYM	PI AFFILIATION	PRINCIPAL INVESTIGATOR	I&T CONTRACTOR
ADVANCED VERY HIGH RESOLUTION RADIOMETER 2	AVHRR 2	NOAA-NESS	NESS STAFF	IT&T
EARTH RADIATION BUDGET EXPERIMENT	ERBE	LARC	G. C. BROOME	TRW
HIGH RESOLUTION INFRARED SOUNDER 2	HIRS 2	NOAA-NESDIS	NESDIS STAFF	IT&T
MICROWAVE SOUNDING UNIT	MSU	NOAA-NESDIS	NESDIS STAFF	JPL
SOLAR BACKSCATTER ULTRAVIOLET RADIOMETER 2	SBUV 2	GSFC	J. FREDERICK	BASD
SPACE ENVIRONMENT MONITOR	SEM	APL	D. J. WILLIAMS	FORD
STRATOSPHERIC SOUDING UNIT	SSU	NOAA-NESDIS	NESDIS SATFF	FOREIGN

Instrument Descriptions
The NOAA 10 Advanced Very High Resolution Radiometer 2 (AVHRR 2) is designed to provide global day and night sea surface temperature, cloud cover, ice, snow, and terrestrial water information in both real-time and tape recorder modes for use in daily weather analysis and forecasting. The AVHRR 2 is a five-channel multispectral scanner which provides images in five spectral regions (one visible, one near-infrared and two infrared) allowing the use of sophisticated multispectral analyses techniques to meet operational requirements. Each channel is supported by its own electronics package consisting of an amplifier, an analog-to-digital converter, and auxiliary electronics.
The NOAA 10 Earth Radiation Budget Experiment (ERBE) instrument, provided by TRW, consists of a medium and wide field-of-view nonscanning radiometer and a narrow field-of-view scanning radiometer. The same instrument is flown on NOAA 9 and EBBS. The ERBE Non-Scanner is designed to measure the intensity of direct solar radiation and diffuse sky radiation. The Non-Scanner has four earth-viewing channels and one solar channel.. The ERBE Scanner is a small spatial resolution instrument (e.g., field-of-view equal to 3 degrees diameter) containing three separate channels. Each Scanner channel consists of a two-mirror telescope, field stop, bandpass filter, and pyroelectric detector-preamplifier assembly.
The NOAA 10 High-Resolution IR Sounder 2 (HIRS 2) is one of three atmospheric sounding instruments used to determine radiances needed to calculate temperature and humidity profiles of the atmosphere from the planetary surface into the stratosphere. The HIRS 2 sounder has twenty channels and made measurements in eleven spectral intervals - including energy bands for ozone, carbon dioxide; nitrogen dioxide and water vapor. The instrument is a cross-course scanning device utilizing a step-scan to provide scanning in the traverse direction, while the orbital motion of the satellite provides scanning in the orthogonal direction.
The NOAA 10 Microwave Sounding Unit (MSU) is one of three atmospheric sounding instruments used to determine radiances needed to calculate temperature and humidity profiles of the atmosphere from the planetary surface into the stratosphere. The MSU is built in-house by JPL for NOAH-NESS. To obtain temperature profiles free of cloud interference, a step-scan device provides transverse scan while the orbital motion of the satellite provides scanning in the orthogonal direction. The microwave sounding unit provides measurements which are made by radiometric detection of microwave energy divided into four frequency channels operating in the 50 to 60 GHz oxygen band.
The NOAA 10 Solar Backscatter Ultraviolet Radiometer 2 (SBUV 2) instrument, which is provided by BASD, is designed to measure the vertical distribution of ozone in the atmosphere. The SBUV 2 measures solar irradiance and scene radiance (back-scattered solar energy) over the spectral range 160 to 400 nanometers. The SBUV 2 objectives are to: 1) make measurements from which the total concentration of ozone in the atmosphere can be determined to an absolute accuracy of I percent; 2) make measurements from which the vertical distribution of ozone in the atmospheric can be determined to an absolute accuracy of 5 percent and 3) measure the solar spectral irradiance from 160 to 400 nanometers.
The NOAA 10 Space Environment Monitor (SEM) provides for measurement of the flux, spectrum and total energy disposition in the earth's upper atmosphere of electrons and alpha particles. The SEM is an extension of the Solar Proton Monitor which flew on the ITOS satellites. The SEM is comprised of three separate sensor units and a data processing unit (DPU). The sensor units are the medium-energy proton/electron detector (MEPED), the high-energy proton and alphaparticle detector (HEPAD) and the total energy detector (TED). The MEPED uses solid-state detector telescopes and omnidetectors. The HEPAD includes a Cerenkov scintillator and photomultiplier. The TED includes a cylindrical electrostatic analyzer and spiraltron.
The NOAA 10 Stratospheric Sounding Unit (SSU) is one of three atmospheric sounding instruments used to determine radiances needed to calculate temperature and humidity profiles of the atmosphere from the planetary surface into the stratosphere. The radiance measurements are made in three channels using a pressure-modulated gas (C02) to accomplish selective bandpass filtration of the sampled radiances. The gas is of a pressure chosen to yield weighting functions peaking in the altitude range of 25 to 50 km where atmospheric pressure is 15, 5 and 1.5 mbars respectively. An 8-cm mirror scans the Earth in eight steps every 32 seconds, producing data at the rate of 0.48 kbps.

Launch
6/27/79(A)
5/30/80(B)
6/23/81(C)
5/14/91(D)
3/28/83(E)
12/12/84(F)
9/17/86(G)